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The Frontier Framework (and its eight Frontier Archetypes): A new conceptual approach to representing staff and patient well-being in health systems

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ABSTRACT

This paper proposes a new conceptual framework for jointly analysing the production of staff and patient welfare in health systems. Research to date has identified a direct link between staff and patient well-being. However, until now, no one has produced a unified framework for analysing them concurrently. In response, this paper introduces the "Frontier Framework". The new conceptual framework is applicable to all health systems regardless of their structure or financing. To demonstrate the benefits of its use, an empirical example of the Frontier Framework is constructed using data from the UK's National Health Service. This paper also introduces eight "Frontier Archetypes", which represent common patterns of welfare generation observable in health organisations involved in programmes of change. These archetypes may be used in planning, monitoring or creating narratives about organisational journeys.

1. Introduction

A growing body of research suggests a clear relationship between employee wellbeing and organisational performance (Renee Baptiste, 2008; Truss et al., 2013; Anitha, 2014; Alfes et al., 2013; Harter et al., 2013; Grawitch and Ballard, 2016). Whilst the performance of health systems at producing benefits for patients is routinely measured in many countries worldwide, the creation of health gain is not the only set of benefits that health systems can affect (Evans et al., 2000). Through policy choices and management decisions, they can alter the environment, the work practices and the remuneration of their employees, which can directly impact upon their well-being (Renee Baptiste, 2008). As an example, poor working conditions can lead to both physical and psychological problems such as work-related injuries, stress, depression and other detrimental conditions (Iacovides et al., 2003). In turn, deteriorating staff welfare can lead to worsening patient outcomes (Heinz, 2004). Therefore, it is vital that staff experience is managed in ways beneficial to patients.

Even though most health systems collect large datasets that could be used to analyse the relationship between staff and patient well-being, there is a currently a lack of scientifically valid methods for jointly presenting this information so decisions can be made (Coulter et al., 2014). The "healthy workplace" is a widely acknowledged occupational health concept that links staff well-being (and its determinants) with organisational productivity and success (Kelloway and Day, 2005). Researchers in the area make the foundational assumption that employee well-being has a causal relationship with organisational performance (Van De Voorde et al., 2012). This belief is receiving increasing empirical support (Wright and Cropanzano, 2000). The World Health Organisation (WHO) recently acknowledged its importance by publishing a global framework for healthy workplaces (Burton, 2010). The document contains flexible, evidence-based models for action that can be applied worldwide regardless of the sector or the setting.

The WHO also provides a definition of a "healthy workplace" as "one in which workers and managers collaborate to use a continual improvement process to protect and promote the health, safety and well-being of workers and the sustainability of the workplace" (Burton, 2010, p.16). The WHO's description is comprehensive in its coverage. In response, the organisation called for the creation of new ways of promoting well-being and productivity in different organisational settings. For instance, the global framework could easily be applied to health systems in most countries. The WHO's guidance on the healthy workplace is based upon the assumption that organisational performance is affected by employee welfare. The evidence for such a relationship in a healthcare setting is compelling. For instance, Pines and Maslach (1978) found that stress and subsequent burnout amongst staff in mental health settings reduced the quality of care for patients. Similarly, Rauhala et al. (2007) observed that work overload reduced the quality of nursing care for patients due to staff stress and absenteeism. In a similar vein, Firth-Cozens (2001) concluded that deficits in patient

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care were associated with stress, depression and alcoholism amongst doctors and other healthcare employees. In contrast, Maben et al. (2012) found that patients treated by satisfied, dedicated and positive staff can have a better experience, with direct implications for their well-being. As a result, they recommended that investment in employee well-being is essential for the consistent delivery of high-quality care. As these studies suggest, there is much more to generating patient welfare than just the performance of technical tasks (such as the prescription of drugs, the provision of surgery and the like).

The purpose of this paper is to outline a new conceptual framework for jointly analysing the production of staff and patient welfare in health systems. The approach is novel because there has been no previous attempt to create a conceptual tool that allows the mapping of these two variables simultaneously. Our approach facilitates performance measurement that reflects the growing evidence that staff and patient welfare are correlated, as well as reflecting the WHO's healthy workplace initiative. In creating this novel framework, the approach is not based upon the principles of microeconomics or welfare economics, which carry many theoretical stipulates that shape the analysis (Kaldor, 1939). For instance, the former is concerned with the relationship between the input of resources and the output of physical production, whilst the FF is concerned with mapping the two outputs of staff and patient well-being. The difference between the two approaches is that microeconomics is concerned with the expenditure of resources to produce outputs, whilst we do not conceptualise staff welfare as something expended in the traditional economic sense. In relation to welfare economics, it is assumed that welfare is maximised. In contrast, we make no normative assumptions about the efficiency of welfare allocations. Instead, we offer a framework that maps observed relationships, which may show higher of levels of efficiency. In doing so, we make no normative claims about the desirability of any output combination. This is purely a performance measuring framework. It is does not adhere to the principles of welfare or microeconomics.

The framework is constructed from a health system's point of view and represents staff and patient welfare simultaneously in a “Frontier Framework” diagram. Plotting the two forms of well-being on the same graph allows healthcare decisions-makers to see if organisations with low (or high) levels of staff well-being also produce low (or high) levels of benefits for patients. The approach also highlights when the relationship between staff and patient welfare is unexpected or deviating from the norm. For instance, an organisation with very high employee well-being may produce poor patient outcomes. The framework is an improvement on the current ways of linking staff well-being and organisational performance (Cotton and Hart, 2003). Fig. 1.1 shows the usual way of conceptualising this relationship. Employee welfare is assumed to be inputs into a unidimensional production function, which has performance as the output. This is problematic because the complexity of the connections between the two variables remains hidden. In contrast, the Frontier Framework provides a better picture of the health of an organisation than either analysing staff or patient well-being separately or using an input-output approach.

To show how management decisions can affect staff and patient welfare over time, eight Frontier Archetypes (FAs) are presented diagrammatically within the Frontier Framework. If adopted in practice, the archetypes could support planning, management and governance in

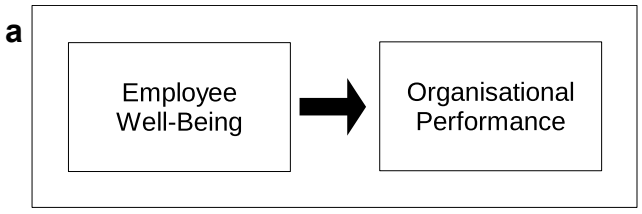
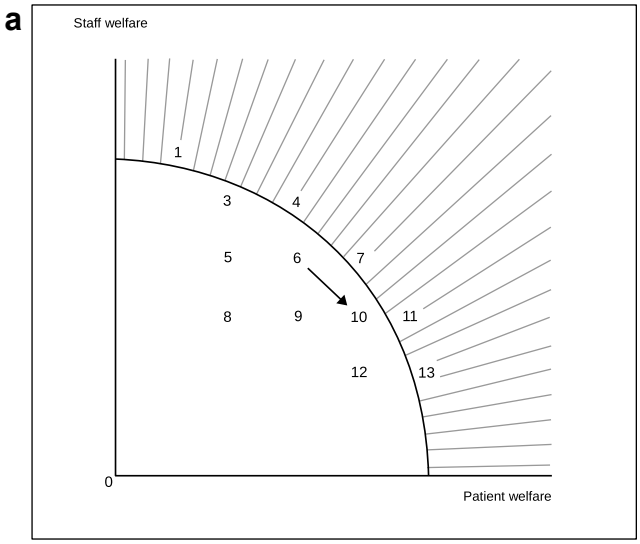


Fig. 1. 1: Standard Wellbeing and Performance model. **2**: Frontier Framework diagram. **3**: Features of the Frontier Framework.



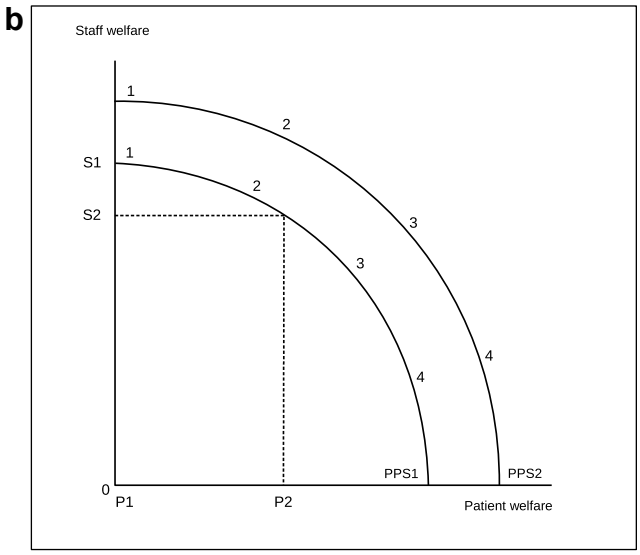


Fig. 1. (*continued*)

ways that could directly improve patient health and create better-working lives for employees. In particular, each FA has an accompanying narrative (or story), which can help frame health system planning and decision-making.

The Frontier Framework, and its associated archetypes, could make a significant contribution to both research and practice, with a clear potential to generate measurable improvements in health systems performance worldwide. The framework is designed to appeal to a broad interdisciplinary and international readership. The approach has relevance for research in a wide range of disciplines, including economics, management science, medical sociology, health psychology, epidemiology and public health. As health systems in all countries (regardless of their structure and public/private mix) can influence both staff and patient welfare, the Frontier Framework is applicable internationally and the concept is transferrable to all health settings. To outline the new framework in full, the following steps are taken: (i) the Frontier Framework diagram is introduced and explained, (ii) the usefulness of the approach is demonstrated using an empirical example, (iii) the eight archetypes are specified and examples of their application given, (iv) benefits and limitations are discussed, and (v) the conclusion is drawn that the Frontier Framework and its archetypes have make an important contribution to both research and practice in a way that

supports health systems monitoring and decision-making worldwide.

2. The production frontier

Fig. 1.2 shows a production frontier created by plotting levels of patient and staff welfare for thirteen hypothetical healthcare DMUs. The number of DMUs usually plotted will depend on the number of organisations being studied, but here we use a small sample as an example. The vertical and horizontal axes represent staff and patient welfare, respectively. In the diagram, greater well-being is shown by locations plotted further away from the origin (0). As it is common practice to rank healthcare providers in terms of their performance, the graphed positions may be used to compare the relative ability of the thirteen DMUs to produce staff and patient well-being (Jacobs, 2001). Out of the organisations plotted, numbers 1, 4, 7, 11 and 13 are the most productive because they exist at the points furthest away from the origin. Their locations are linked by a solid line that represents the frontier of what is technically possible in terms of production. The hashed shading shows output levels outside of the frontier that are not feasible at current levels of performance.

Fig. 1.2 represents the highest levels of performance currently achieved by DMUs. Organisations within the frontier (2, 3, 5, 6, 8, 9, 10 and 12) exhibit lower levels of output than their frontier counterparts. The relative performance of each organisation may be judged in terms of its position relative to the frontier and other DMUs. For instance, organisation 6 outperforms organisation 8 because of its position is nearer the frontier. If it wishes to move closer to the frontier, an organisation may improve staff welfare only (a vertical move upwards), increase patient welfare only (a horizontal move only), or a combination of both (which involves a simultaneous increase in both forms of well-being). Therefore, positive gains are always shown by transitions due north, due east or northeasterly. In the Frontier Framework, it is assumed that such moves are always beneficial regardless of whether the gains accrue to staff only, patients only, or a mixture of the two.

Fig. 1.2 also illustrates how trade-offs are made between staff and patient welfare. DMUs frequently make decisions to produce one form of welfare by sacrificing another. For instance, a short-term push to improve patient well-being (that is, shifting right in the frontier 7 diagram) may be achieved at a cost to staff (that is, a downward shift in position). A trade-off of this type can be represented by a downward sloping arrow. For instance, if organisation 6 wishes to move to the position occupied by organisation 10, then staff welfare must be sacrificed to create patient benefits. This is signified by the south-easterly sloping arrow. Wherever they are located within the Frontier Framework diagram, downward sloping arrows like the one presented in Fig. 1.2 always represent a trade-off because one type of welfare is gained by a loss of another. The same logic also applies to arrows pointing northwesterly. As well as showing rankings and trade-offs, the Frontier Framework diagram can be used to represent a shift outwards in the productive capabilities of frontier DMUs.

As Fig. 1.3 shows, an improvement in maximum possible output can be shown as a shift similar to that from PPF1 to PPF2. If organisations (1, 2, 3 and 4) on the frontier improve their ability to generate staff and patient welfare, then the frontier will be pushed north-easterly to PPF2. Fig. 1.2 may also be used to illustrate the economic concept of “opportunity cost”. In standard economic theory, opportunity cost is defined as the “value of benefits foregone” by choosing one alternative over the next best equivalent (Palmer and Raftery, 1999). For instance, DMUs that choose to increase pressure on key staff by increasing the strictness of management practices may observe welfare gains for patients who receive better care. Therefore, the opportunity cost of the decision to reduce staff experience is the value of the patient well-being gained.

An example is shown in Fig. 1.2 where organisation 1 is at the point where PPF1 touches the vertical axis. At this position, all of 1's production effort is focused on producing staff welfare only. (In most healthcare settings, this position is unrealistic because patient welfare is paramount. However, this extreme example is useful at illustrating the concept of opportunity cost.) If organisation 1 decides to reduce staff welfare 8 from S1 to S2, but uses its productive capacity to stay on PPF1, then the result will be an increase in patient welfare from P1 to P2. As shown, the gain in patient welfare is much larger than the loss of staff welfare (because of the assumption of diminishing marginal returns). In economic terms, we may say that the opportunity cost of producing (P2 – P1) is (S1 – S2). Therefore, the diagram illustrates that improvements in patient welfare often have an opportunity cost, which health system decision-makers should identify, measure and consider. The same is true in the opposite situation where staff welfare is improved at a cost to patients.

An important part of the FF approach is the acknowledgement that the relationship between staff and patient welfare may be both positive and negative. The assumption underpinning the literature is that, employee welfare is often affected by employer actions. As a result, patient wellbeing can fall significantly. For this very reason, The WHO promotes health workplaces. The FF is equally able to accommodate positive and negative relationships between staff and patient welfare. Indeed, the archetypes presented below are designed to show how management decisions can have both positive and negative implications for both staff and patients.

2.1. An empirical example

The Frontier Framework is designed to be used empirically in planning, management and research. To demonstrate the usability of the approach, data from the UK's National Health Service (NHS) was collected and plotted in Fig. 2. To represent staff welfare, data on the

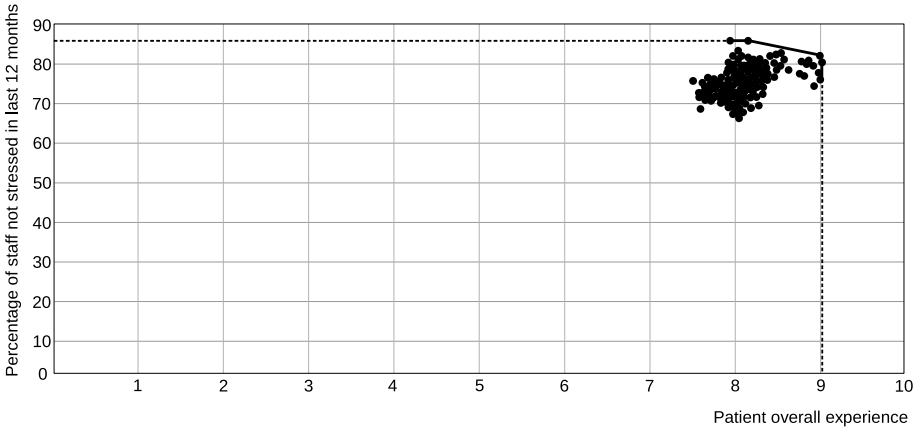


Fig. 2. Percentage of staff not experiencing stress versus patient overall experience of hospital care.

"percentage of staff suffering work-related stress in last 12 months" in NHS Acute Trusts in England was taken from the NHS Staff Survey 2015 (NHS, 2015). To make this variable useable in the Frontier Framework, inverse results were created, so that the vertical axis of Fig. 2 represents the percentage of staff who did not experience work-related stress in the last twelve months. To create a joint output co-ordinate for each acute hospital, data for the horizontal axis was collected from the NHS Adult Inpatient Survey 2015 (Care Quality Commission, 2015). Questions 72 of this survey asked patients to rank their overall experience of hospital care on a scale of 0–10, which is shown on the horizontal axis of Fig. 2. Combining the two datasets, information for 149 trusts was useable in the analysis.

The data presented in Fig. 2 is exploratory. Other sources could have been used, and wider measures of staff and patient welfare adopted. For our current purposes, employee stress and patient experience seem to reflect staff and patient welfare very well. For the following reasons the distribution of the data points fit nicely into a frontier diagram. First, there are a small number of productive organisations that define the frontier. Next, the majority of hospitals sampled are within the frontier, suggesting that their performance could be improved. Finally, there is clear evidence that some hospitals perform better at producing staff welfare than patient well-being, and vice versa. Combined, these observations suggest that there is a relationship between staff and patient welfare in UK acute hospitals.

3. Frontier Archetypes

The figures presented in this paper so far plot multiple DMUs on the same diagram. This method is useful for comparisons between many organisations and establishing their position relative to what is productively feasible. In contrast, in this section the Frontier Framework represents single (or a small number of) organisations. The frontiers approach is still adopted, but the emphasis is on dynamic movements in DMU position (that is, changes in staff/patient welfare co-ordinates) rather than a static ranking of comparable organisations. In the dynamic analysis, several stages (that is, two or more) in the transition path are shown in a single diagram. For instance, if a productive acute hospital merges with a failing neighbour, then the various stages of their merger are shown in terms of improvements and/or deteriorations in staff and/or patient welfare. Representing the stages of change in this way is important because: (i) DMUs wish to know the welfare consequences of their decisions, (ii) the trade-offs between staff and patient welfare are not ignored, and (iii) patterns in welfare pathways may be identified and used in health systems decision-making.

As transitions in staff and patient welfare tend to follow commonly observable patterns, in this paper we adopt an "archetypes" (that is, original patterns or models from which all things of the same kind are copied or based) methodology for mapping the intended and the unintended consequences of change. The archetype approach is not new (Kirkpatrick and Ackroyd, 2003). It is particularly useful for the comparative study of healthcare organizations (Dent et al., 2004). The innovation in this paper is not the use of the archetypes in a healthcare setting, but their application within a frontier diagram that include both staff and patient welfare.

As the eight FAs presented below illustrate, the Frontier Framework is particularly amenable to representing the consequences of DMU choices in dynamic stages. For instance, the first archetype clearly shows how a short-term push for gains in patient welfare (in stage one) can have the unintended consequence of reducing staff well-being (by the end of stage two). As the framework is conceptual, no specific time-period is allocated to each of the transitional periods. However, it is recommended that: (i) each stage is comparable in time to all others in the same diagram, and (ii) stages are of a significant length to generate sizeable and observable changes in the key variables of staff and patient welfare. By designing appropriate stages, FAs can represent common patterns of change (and their related feedback loops) diagrammatically. For instance, archetype seven shows how a plan to improve patient welfare (in the short term) can create an unintended spiral downwards in both patient and staff well-being (in the longer-term). As this example illustrates, the dynamic structure of the various archetypes makes them useful for mapping the welfare 11 consequences of choices made by DMUs.

The FAs are designed to be valuable for health systems planning, strengthening and research. As well as the archetypes listed in the subsections below, readers may be able to identify and to create archetypes of their own, based upon the principles outlined here. Therefore, the Frontier Framework, and its associated archetypes, could make a significant contribution to both research and practice, with a clear potential to generate measurable improvements in health systems performance worldwide.

3.1. Archetype One

Within frontier organisation, short-term push for patient welfare improvements Within most healthcare systems, the majority of providers are less productive than their leading-edge counterparts. The poorest performing organisations tend to have common features such as reduced patient outcomes, low staff morale and inadequate budget management (Verbeeten, 2008). Fig. 3.1, represents a DMU with relatively low staff and patient welfare, which is shown by point A. To improve performance, the hospital develops a new mission statement (McDonald and Sarfraz, 2015). In the short term, it achieves an immediate gain in patient welfare only (with no improvement in staff well-being). This is shown as a horizontal move from A to B. Although patient care improves initially, increased pressure on employees results in a fall in their welfare. As an example, staff burnout is common amongst nurses pushed too hard to care for patients (Khamisa et al., 2015). As their well-being deteriorates, staff are less able to sustain improvements in patient care. The organisation consequently moves from B to C, which yields fewer benefits in both dimensions. In sum, FA One represents an organisation unable to maintain planned improvements in patient outcomes, with detrimental consequences for staff. If a downward sloping arrow was drawn from A to C, this would represent the opportunity cost of staff benefits sacrificed for patient gains.

3.2. Archetype two

Within frontier organisation, virtuous cycle of improvements Well managed, healthy organisations are able to create benefits for their customers whilst improving staff quality of life. Often, within frontier DMUs have the capacity to achieve the same level of outcomes as their peers on the frontier, but fail to do so because of a lack of appropriate leadership. For instance, Archetype Two shows an organisation far from the frontier in both dimensions of well-being. A change in its senior management team results in better planning, stronger governance and enhanced delivery mechanisms. In particular, stricter adherence to the latest evidence-based practice generates better patient outcomes, which helps clinicians discover what works, leading them to seek more evidence (Kovacs, 2015). Consequently, both staff and patient welfare increases from A to B. Because the improvements were properly planned and executed, they are sustainable. In contrast to Archetype One, benefits for patients are not achieved at an opportunity cost to employees. In this archetype, strong leadership and good management practice create a "virtuous circle", which makes the achievements secured during stage one, the stimulus for further positive changes during the next stage. As a result, the advances secured during the move from A to B lead to further gains for both staff and patients, from B to C. Then, further gains are made from C to D. The process of improvement stops when the frontier is met because the organisation knows how to catch-up with its leading-edge peers but does not know how to surpass their performance. In sum, FA Two represents a successful DMU, whose management practices create a virtuous circle that leads to continual

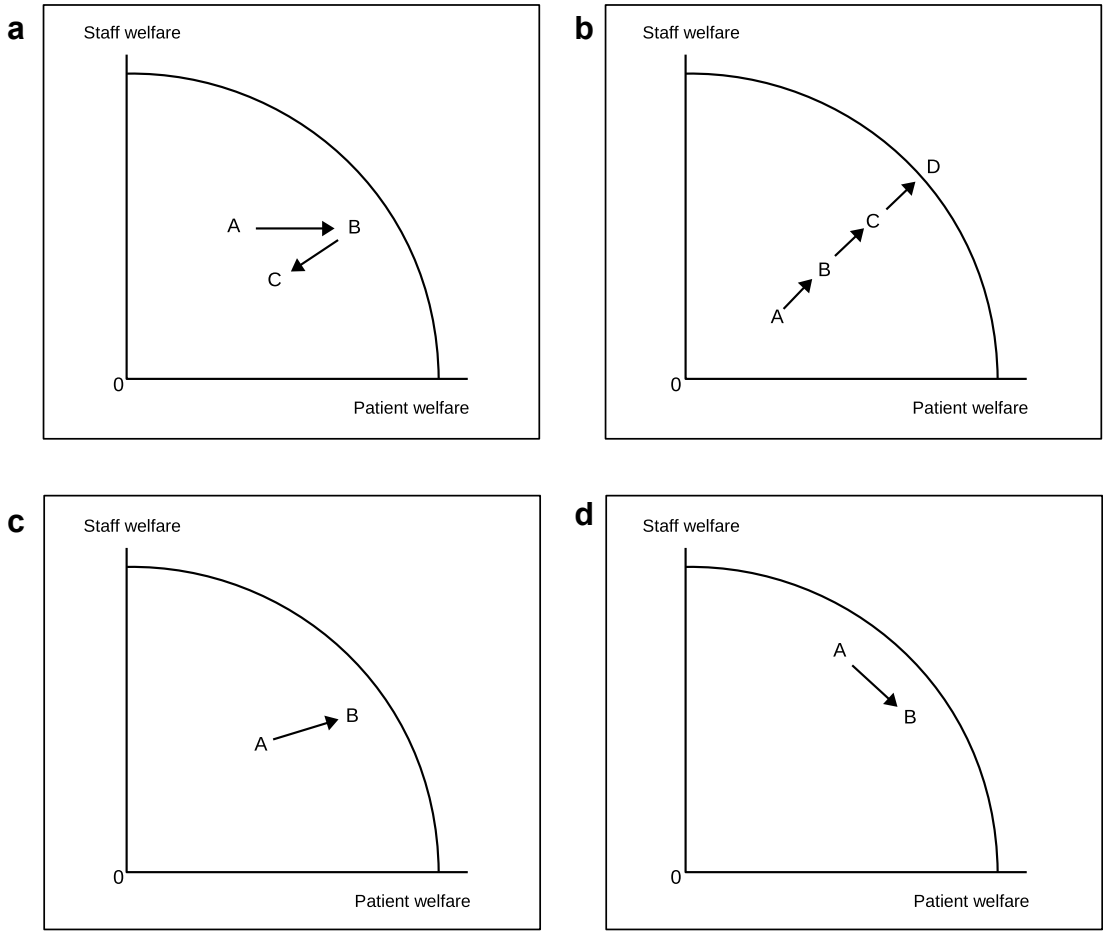


Fig. 3. The eight Frontier Archetypes. **1**: Within frontier organisation, short term push for patient welfare improvements. **2**: Within frontier organisation, virtuous cycle of improvements. **3**: Within frontier organisation, focusing on patients more than staff. **4**: Frontier organisation, trading-off but not improving. **5**: Frontier organisation, sustainable improvements. **6**: Frontier organisation successfully merging with organisation within the frontier. **7**: Stuck within the frontier, failing organisation. **8**: Frontier hospital working with failing nursing home.

improvements for both staff and patients until the frontier is reached.

3.3. Archetype three

Within frontier organisation, focusing on patients more than staff Excellent management can create excellent results. However, not all objectives can always be achieved with available resources. Good leadership involves choosing the best alternatives amongst competing options. Consequently, difficult decisions must be made and compromises reached. Successful management involves delivering results as planned based upon such hard choices. Archetype Three shows an organisation choosing to focus more on patient outcomes than staff well-being. With limited resources, few DMUs can afford to generate equal benefits for patients and employees as they strive to deliver better results. As an example, this could be a healthcare provider that has failed to involve staff in the process of re-designing patient services (Robert et al., 2015).

With constant pressure on delivering improved outcomes for patients, most healthcare providers focus less on enhancing the wellbeing of their employees. For instance, the organisation represented by Archetype One did nothing to promote staff well-being. At the other extreme, Archetype Two did as much for staff as patients. Between these two approaches, Archetype Three probably represents the pathway most commonly followed by healthcare organisations seeking gains. The DMU is well within the frontier at point A and decides to focus its energies on improving patient wellbeing. During this process, staff welfare improves slightly, but there is no substantial push to improve the quality of their lives. For instance, a mental health service might offer staff wellbeing initiatives (Coates and Howe, 2015). However, extra resources are not provided to cover growing workloads.

In balance, small gains are secured for employees, with the result that their well-being is not deteriorated by patient-focused policies. In the diagram, the move from A to B is beneficial for patients, but also avoids deteriorations in staff well-being that could affect patient care. Despite its success, the organisation does not reach the frontier. As few DMUs actually reach their target frontier, position B probably reflects a good achievement for a lagging organisation keen to improve. In sum, FA Three shows an organisation within the frontier that focuses primarily on patient welfare, but in a way that does not deteriorate staff well-being.

3.4. Archetype four

Frontier organisation, trading-off but not improving Archetype Four portrays an organisation in the challenging position of wishing to make substantial gains in patient welfare but being limited in its ability to do so by its nearness to the frontier. As Fig. 3.4 shows, if the organisation tries to improve patient welfare only (shifting horizontally to the right), the frontier would soon be reached. This implies that the technical means of creating patient well-being (such as the provision of drugs and surgery) are almost exhausted in their ability to generate substantially more improvements. With the potential for technical gains being limited, the DMU may choose to deteriorate staff welfare as a short-term means of improving patient outcomes. For instance, clinicians can be

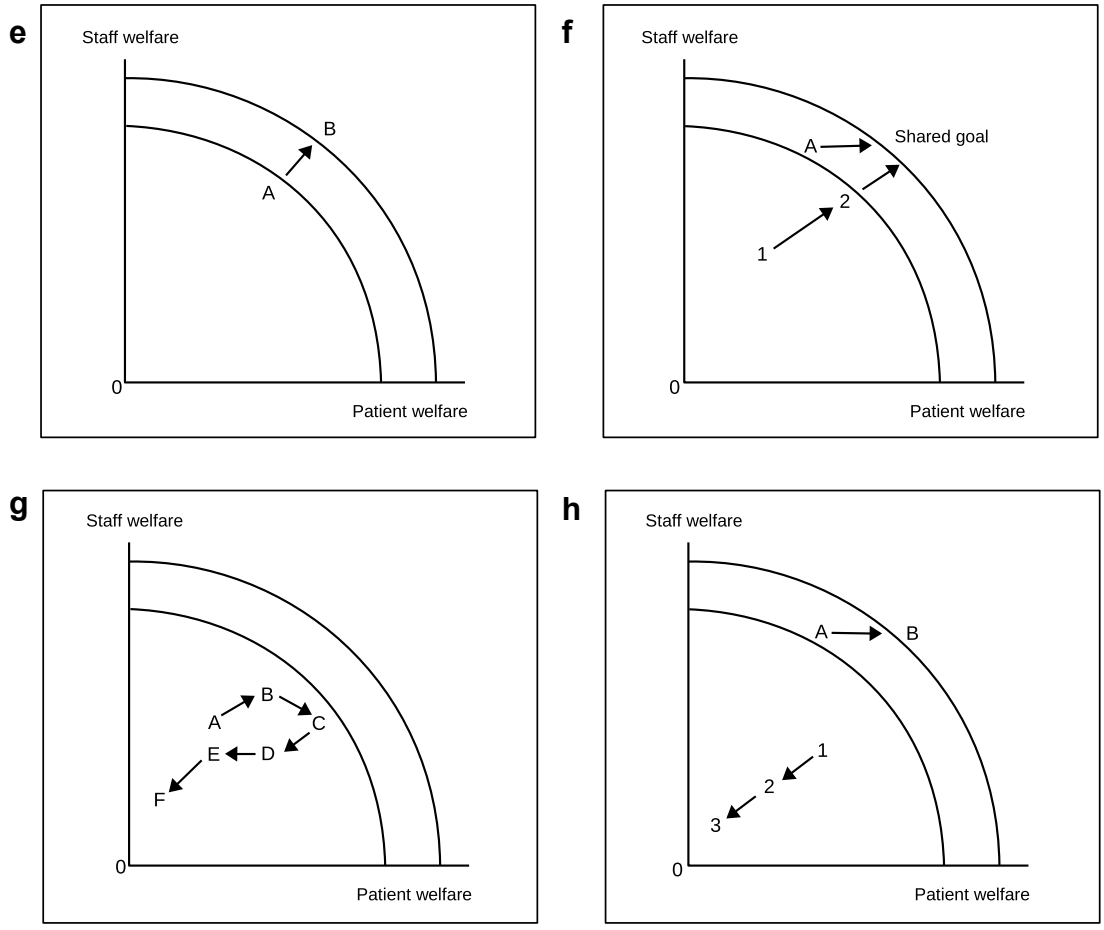


Fig. 3. (*continued*)

pushed to work harder, to sacrifice more and to give from their own stock of well-being (Scheepers et al., 2015). In the short-term, patients may benefit from this tradeoff. However, the opportunity cost is a loss of staff welfare. As overall gains are not made, the DMU moves no nearer to the frontier. Instead, the trade-off between patient and staff welfare is represented by the south-easterly shift from A to B. Even though this shift helps the DMU achieve short-term gains for patients, the deterioration in employee well-being suggests that the gains may be short-lived. In sum, FA Four represents an organisation near to the frontier that is forced to diminish the well-being of its staff to make short-term gains in patient well-being. This may not be a sustainable strategy, particularly when the path followed by Archetype One is considered.

3.5. Archetype five

Frontier organisation produces sustainable shift in frontier Leading-edge organisations often push forward the frontier of what is possible. For instance, hospitals recognised for transformational leadership, exemplary professional practice and constant innovation are likely to improve both staff and patient well-being (Kutney-Lee et al., 2015). Very rarely do DMUs situated within a frontier find ways of moving beyond the leaders in their field. This is because followers tend to adopt existing technical means of production rather than innovating the ways things are done. Archetype Five shows a leading-edge organisation that defines the bounds of what is possible with current technology. Situated at A, the DMU cannot improve upon its current performance unless its frontier shifts away from the origin. Frontiers usually move outwards because of a change in technology or enhanced methods of production. If better ways of treating patients are developed, or new ways of increasing staff well-being are implemented, the frontier will move. Such a situation is shown in Fig. 3.5 where new technology and/or improved production methods shift the DMU from A to B. At the new frontier, the organisation produces more of both forms of welfare, which benefits both staff and patients. For example, a hospital introduces transformational leadership that improves job satisfaction and creates a better patient experience (Medley and Larochelle, 1995; Jabnoun et al., 2005). As both groups gain, the increased production output is likely to be sustainable. In sum, FA Five represents an organisation that utilises new technology and/or production methods to successfully shift out its frontier.

3.6. Archetype six

Frontier organisation successfully merging with organisation within the frontier As shown in Fig. 3.6, leading edge organisations such as the one at A often try to push the boundaries of what is possible. Within the Frontier Framework, this is shown by an outward shift in the frontier. As well as innovating the production process, the best organisations are often asked to help those struggling to raise their standards. For instance, the DMU at point 1 has staff and patient welfare levels well below those achievable. To improve its productivity, the organisation at 1 merges with the organisation at A and a shared goal is formalised for them both. However, the experienced management teams at both hospitals understand the factors that promote success (Cohen et al., 2001). For instance, no clinical service should be integrated simply for the sake of merging. Constant communication is necessary between leadership and staff. The Board should be patient in having events progress over time. During the merger, the DMU at A decides to maintain a steady state in its performance, whilst helping its new

partner reach the frontier at point 2. This move is the first stage in the merger process. As the initial transition is successful, the merged organisations decide to innovate their production processes so that their joint frontier is pushed outwards. Given its relatively high staff satisfaction levels, the leading organisation focuses on improving patient welfare only (a horizontal move from A rightwards). Because of its central location, the partner decides to generate both staff and patient well-being (a north-easterly shift from point 2). As a result of their combined efforts, both organisations successfully reach their shared goal during the second stage of the merger. Consequently, a new frontier is created and both DMUs achieve similar levels of staff and patient well-being. In sum, FA Six shows how a frontier organisation can successfully help an organisation within the frontier improve its performance, with longer-term gains for both.

3.7. Archetype seven

Stuck within the frontier, failing organisation Sometimes organisations cannot break their vicious cycle of poor performance. For instance, the DMU shown in Fig. 3.7 has relatively low levels of both staff and patient welfare. In response, the Chief Executive is sacked and management consultants are employed to take remedial action. Introducing a new management regime, short term gains are made in both forms of well-being, shifting the organisation from A to B. Although this success is celebrated, the organisation does not have any substantial new money to promote sustainable change. Desperate to replicate their achievements to date, the management consultants increase pressure on clinical staff. As a result, patient outcomes improve, but only because there is a trade-off with staff well-being that moves the organisation from B to C. From a management perspective, this transition is not viewed negatively. Patient outcomes have improved greatly over the last two periods, whilst staff welfare has not dropped below its original position at A. Given their success, the consultants leave claiming that the failing organisation has been “turned around”. On the surface, their claim is true: things have gotten much better for patients. However, underneath a seed of future failure has been sown. As an example, evidence suggests that insecurity amongst health workers undermines their trust in their workplace. In turn, this affects their performance and the services that patients receive (Afford, 2003). Although they are not objectively worse off, staff feel relatively deprived because they compare their current welfare to the peak (at B) not their original position (at A). The perceived loss of welfare demoralises employees and their sense of well-being drops significantly, pulling patient welfare down as well. The organisation is now at point D. During the next period, staff welfare stabilises but patient well-being falls, returning the organisation to the original level of patient welfare (observed at A). The organisation is now at E. In two transition periods, the work of the management consultants at improving patient well-being has been completely undone, whilst driving staff welfare to its lowest ever level. Given the downward cycle, the organisation reaches a crisis point, and both forms of welfare rapidly fall to F. This organisation is clearly failing as a result of short-term solutions creating long-term problems. At point F, the situation is so bad that the organisation probably has little option but to close. In sum, FA Seven shows how an organisation can become stuck within a vicious circle of poor performance, despite initial efforts to improve.

3.8. Archetype eight

Frontier hospital working with failing nursing home Economists talk about “hidden action” and “hidden information” as being common features of any situation in which an individual or organisation tries to transact with a third party (Arrow, 1984). In Fig. 3.8, the hospital shown at point A decides to work more closely with the nursing home shown at point 1 in order to improve patient discharge times. From the hospital's perspective, the joint working partnership is ideal because they both have similar levels of patient welfare. What the hospital does not know (because of hidden information) is that the nursing home has relatively low levels of staff well-being. As the two organisations begin to work together, differences in their levels of staff flourishing begin to show. During transition period one, the motivated and happy staff in the hospital improve patient well-being from A to B, pushing their frontier outwards. In the nursing home, a decline in staff welfare reduces patient welfare from 1 to 2. For instance, staff experience burnout and inappropriate medication use begins to rise (Cooper et al., 2016; Beers et al., 1991). Given the unacceptably low levels of staff and patient well-being in the home, the hospital ceases the joint working relationship. During the period that follows, the hospital remains at its productive limit (shown by B), whilst the nursing home declines further to 3. If properly monitored and sanctioned, the nursing home may be forced to close or to change management because of its unacceptably poor performance. In sum, FA Eight shows how a leading-edge organisation can misinterpret signals from a potential partner and enter into a short-term relationship that fails to deliver expected outcomes.

4. Discussion

The Frontier Framework focuses on the importance of the relationship between staff and patient well-being. Evidence that staff well-being directly affects patient outcomes is widespread but receives less attention than deserved because studies are published in a wide range of journals, across place and time. Staff input is vital to patient welfare (Mitchell, 2013). Unhappy staff are likely to produce poorer outcomes (Aiken et al., 2002). For instance, Eaton (2000) found a link between human resource management and the quality of patient care in nursing homes. West (2001) argued that the management of staff matters for the quality of patient care. Garman et al. (2002) discovered a connection between staff burnout and patient satisfaction. West et al. (2002) reported that the management of employees affects patient mortality in acute hospitals. Chang et al. (2009) found a relationship between job satisfaction and patient perceptions of care quality. Similarly, McHugh et al. (2011) suggested that job dissatisfaction, burnout and frustration amongst nurses creates problems for patients. Graban (2011) presented the case that hospital management could improve employee satisfaction alongside patient outcomes if a lean methodology is adopted. This handful of examples (combined with those cited in the introduction) reflects a wider literature that outlines a direct link between staff and patient well-being.

Given the importance of this relationship, the Frontier Framework is likely to be a useful tool for analysing performance in health systems. From the perspective of ranking DMUs, the Frontier Framework can help decisionmakers determine which organisations are performing best. However, the basic diagram does not capture the dynamic nature of welfare creation. In response, the Frontier Framework was accompanied by eight FAs. These archetypes show how common patterns of change affect staff and patient well-being. Although archetypes are not normally incorporated into frontier diagrams, there is much support for this approach. For instance, Woodward et al. (1999) examined a single hospital that attempted to re-engineer its working practices. Attempts to improve hospital performance resulted in depression, anxiety, emotional exhaustion and job insecurity amongst employees, particularly during the first year of the change process. According to the authors, this pattern continued. Two years after the initial reforms, they observed deteriorations in team working, lack of role clarity and an increased use of distractions to cope. During both periods of change, patient welfare suffered. As this example illustrates, most organisations are on a journey.

The FAs capture the steps in eight journeys commonly followed by health system organisations. Given their dynamic nature, the archetypes (along with those created by users themselves) are likely to be invaluable in health systems planning, management and research. To be useful, the Frontier Framework must be adopted in practice. As the NHS

example in Section Three outlined, data on staff and patient welfare must be collected for a frontier to be created. To be useful in a health system context, data must be locally relevant, meaningful and accepted as a good proxy for the welfare types being measured. Once the relevant data is collected, a Frontier Framework diagram can be easily created in a software package such an Excel by creating a scatterplot of the two variables. Such a diagram will help decision-makers and analysts rank their DMUs in terms of productivity. As this analysis is static, further insights can be created by working with FAs that reflect local circumstances.

The various archetypes can be used as a conceptual tool for framing discussions or can be constructed with data from individual organisations. The FAs have many uses but are probably most relevant when large changes in staff or patient welfare are involved. In sum, the conceptual framework outlined here suggests that the Frontier Framework and its accompanying archetypes could have an important place in health systems planning, management and analysis. Limitations Frontiers are usually used by economists and operational researchers to measure efficiency and have been frequently used in health care settings (Worthington, 2004). The frontiers approach is now widely accepted (Caro et al., 2010). In a healthcare setting, frontier estimation has been used to analyse the uppermost levels of efficiency achievable by DMUs (Newhouse, 1994). Data Envelopment Analysis (DEA) is a main approach to frontier estimation used by economists and operational researchers (Seiford and Thrall, 1990; Bates et al., 1998; Cooper et al., 2004). In contrast to the usual DEA approach, the Frontier Framework is not designed to measure efficiency. The frontiers drawn in the diagrams are designed to show the limits of what may be produced. They are not meant to represent maximum levels of costeffectiveness. This could be seen as a limitation of the approach when applied to cash-limited health systems. In defence, the framework is concerned with production possibilities rather than levels of economy. Whether organisations use less or more resources to secure their position is irrelevant. Just as spectators ignore the efficiency (measured in terms of the calorific inputs they consumed versus their position crossing the finishing line) of athletes who win a race, the Frontier Framework is only interested in the position or ranking against the frontier. Therefore, the approach is not applicable to situations where the relationship between resource use and outcomes is deemed important. The Frontier Framework solely focuses on welfare outputs. Resource inputs are not considered in this conceptual framework.

5. Conclusions

The Frontier Framework is a novel approach to analysing staff and patient well-being. The framework has relevance for research in a wide range of disciplines and is transferrable to all health settings worldwide. This paper demonstrates the validity of this novel methodology. To enrich the analysis, eight FAs were introduced to represent common patterns of change. If adopted in practice, the archetypes could support planning, management and governance. Therefore, the conclusion is drawn that the Frontier Framework, and its associated archetypes, could make a significant contribution to both research and practice, with a clear potential to generate measurable improvements in health systems performance worldwide.

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